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ABSTRACT

This investigation studied the performance of fifteen normal and fifteen language-disabled children on experimental pragmatic tasks and on a standardized Piagetian measure of sensorimotor intelligence. The children were matched for mean length of utterance, all subjects performing at the holophrastic level. A series of experimental measures was designed to elicit declarative performatives, imperative performatives, and encoding of the most informative element in a context. All aspects of the child's behavior were observed, and the responses were scored in a dichotomous manner: whether or not they had encoded the most informative, i.e., changed, element. The responses to the experimental presuppositional items were also scored in terms of the level of declarative generated. The children with normal language development at the holophrastic stage could performatively encode the most informative contextual element with either linguistic or non-linguistic means significantly more frequently than a 50-50 chance would permit. The language-disabled children, however, were able to signal the most informative element with a sensorimotor performative but were unable to do so linguistically. The statistical analysis revealed that the language-disabled subjects' pragmatic use of the language was deficient, even though they had been matched for level of linguistic performance with normal subjects. (Author/NCR)

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THE EARLY PRESUPPOSITIONS AND PERFORMATIVES OF NORMAL AND LANGUAGE DISABLED CHILDREN

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Semantic-pragmatic studies of child language acquisition have emphasized the central role played by context in the communicative situation. Pragmatically motivated research has focused upon information obtained by comprehensive observation, documentation, analysis and interpretation of the physical and social contextual elements present in the child's communicative situation. The use of context to disambiguate child utterances has not only led to a richer understanding of semantic and syntactic development, but also advanced our knowledge of the child's pragmatic development. At the holophrastic stage of language development, study of contextual components has revealed two rather significant "bits" of information: first, that the child encodes that element which carries the greatest amount of information to a listener; and second, that while a particular utterance may function as a "label" or be regarded as a label in one context, it may function as a request-command in quite a different context, depending upon the child's intended meaning.

The first observation was made by Greenfield and Smith (1976) and has been a point of recent controversy. They noted that even as early as the one word stage, children encoded the most informative element in a context, i.e., the element undergoing the greatest amount of change. In terms of information theory, the uncertain "bit" of information is considered to carry the greatest amount of information to a listener. This concept, then, predicts that when a child is engaged in play with an object and then begins to act upon another object, he will verbally encode the new object when communicating to his listener. It also predicts that when a child is using an action schema on a particular object and changes that action schema on the object, he will encode the element which has changed, i.e., the action pattern. The object will not be encoded, since it has remained a constant element in the interaction and, consequently, is less informative.

Bates (1976) has interpreted this data in a somewhat broader manner. She viewed it as having its basis in the child's attentional figure-ground mechanism. It marks a step in the differentiation of the child's orientation response to novel stimuli. Instead of simply orienting his body to the new information, the child generates an utterance. It serves as his comment upon the presupposed topic or background of the situation's context which he shares with the listener. Bates felt that this signals an early stage in the development of psychological presupposition in the child. She has defined psychological presupposition as that property of the adult speaker's intention by which he assumes that he and his listener share information not necessarily signalled in the surface form of his sentence. It allows the speaker's comments to carry in discourse with his listener. The

child first begins to presuppose as a result of his differentiating attentional ability. Very young children are successful in communicating with adults because they can presuppose information which they cannot necessarily linguistically encode due to information load limitations. Hence, the notion of psychological presupposition seems to be relevant to a consideration of what it is that the child encodes with his early utterances. This issue, however, has yet to be resolved with controlled experimentation.

Other investigations speak to the second observation of early child language at the holophrastic stage. Bates' data (1975, 1976) has demonstrated that the child can generate both declarative and imperative performatives not only with his holophrastic utterances but also with his prelinguistic or sensorimotor action patterns. Her findings have been supported by the results of a controlled cross-sectional investigation (Bates et al, in press) and by data from Sugarman (1973). These findings have shown that an utterance which adults might regard categorically as a label, may function as a declarative in one situational context, and as an imperative in quite another context. And, indeed, if one considers the relative success of the child's earliest communication, the psychological reality of the child's early performatives seems to be well taken. In fact, the performative efficiency of the child's earliest utterances was probably a factor responsible for early investigators' (Stern and Stern, 1907; deLaguna, 1972; and McCarthy, 1954) interpretation of the holophrase as equivalent to the adult's full sentence.

It has long been assumed that the presyntactic language disabled child will function much like the normal child at the one word stage of psycholinguistic development. However, Zaner (1974) has suggested that the communicatively disordered child may be fragmented in his social interactive development. Morehead's (1973) data seem to indicate that the language deficient child has difficulty with all types of symbolic representation: linguistic and non-linguistic. The capacity for social interaction and the capacity for symbolic representation are two skills that are clearly related to the ability to generate performatives and to create the proposition/presupposition organization. This paper will describe a controlled experimental study which sought to answer three questions:

(1) Do normal children at the holophrastic stage encode the most informative element in a context?

(2) Do language disabled children at the holophrastic stage differ significantly from normal children in their presuppositional encoding and in their declarative and imperative performatives?

(3) Are the cognitive abilities of the sensorimotor intelligence period significantly related to pragmatic performance?

The Study

This investigation studied the performance of fifteen normal and fifteen language disabled children on experimental pragmatic tasks and on a standardized Piagetian measure of sensorimotor intelligence.

The children were matched for mean length of utterance, all subjects performing at the holophrastic level. They came from the middle socio-economic classes defined by the Index of Status Characteristics (Warner, Meeker, and Eells, 1949) and they demonstrated mental development quotients within the normal range on the Bayley Scales of Mental Development (1969). Each normal subject had been identified as such by his pediatrician. Each language disabled child had been so diagnosed by his specialist in developmental pediatrics. The physician's examination had also ruled out the presence of any complicating pathological neurodevelopmental reflexes. The referring physician's diagnostic impression was confirmed by subsequent evaluation by a speech pathologist who also ruled out the presence of complicating oral apraxias. The language disabled children in this study, then, differed from the normally developing children with whom they were matched in that they were chronologically at least twelve to eighteen months older.

A series of experimental measures was designed to elicit declarative performatives, imperative performatives, and encoding of the most informative element in a context. The measure of presuppositional encoding consisted of ten items which had been selected from a larger item pool piloted in an earlier experiment. These items were structured so as to provide the child with contexts in which his action pattern or activity remained the same while the object or toy with which it was executed became changed. For example, one item on this measure was designed so that the examiner modeled the action of throwing blocks into a pail. After the child executed the activity a specified number of times, the examiner handed him a small doll figure instead of the anticipated block. All of the items were designed so that the new element in the context was readily identifiable, that it elicited words which were most often found in the lexical repertoires of children at the holophrastic stage, and that the contexts created an interaction between child and examiner, thus permitting a shared attention. All aspects of the child's behavior were observed and recorded using Sugarman's system of molecular notation (1973). The subjects' responses were scored in a dichotomous manner: whether or not they had encoded the most informative, i.e., changed, element.

In that Greenfield and Smith (1976) had observed that children were also able to encode the most informative element in a context when the objects remained the same but their activity changed, items were designed to reflect this aspect of presupposition. The pilot study, however, revealed that the children in the pilot sample, who had a mean MLU of 1.38, did not have sufficient words in their lexicons to permit them to linguistically encode the changed action pattern. Consequently, this observation as yet remains empirically unresolved.

The subjects' responses to the experimental presuppositional items were also scored in terms of the level of declarative generated. This effort was motivated by recent findings by Bates, Camioni, and Volterra (1975), Bruner (1975), and Dore (1973) which indicates that even at the prelinguistic and holophrastic stages, children use some form of natural gesture and/or vocal behavior or linguistic symbolic behavior to attract the adult's attention to some object, activity, or person in the situational context. A five point scale was devised to assign score values to declarative performative responses. The weights were applied to response

descriptors which corresponded to the major stages in the developmental progression of the declarative as described by Bates et. al., (1975). During the pilot study, the application of these weights was studied and determined with Green's (1956) modification of the Guttman scaling procedure (1947). The results of this analysis indicated that the progression of scoring levels was significantly scaleable. It achieved an index of consistency of .8134. A follow-up cross-sectional study conducted by Bates, Benigni, Bretherton, Camioni and Volterra (in press) confirmed this sequence.

The experimental imperative measure consisted of ten items which had been selected from a larger item pool which had been pilot studied. Investigations conducted by Sugarman (1973) and Bates et. al., (1975) indicated a distinct progression in the development of the imperative performative from a sensorimotor to a linguistic response. The items in this measure were designed after Sugarman's (1973) communication tasks. Each item created a situational context in which test stimuli were held within the child's visual field but just out of his grasp. For example, on one item the examiner gave the child an empty plate. The examiner held a dish of cookies just out of the child's grasp. When the child made a response, the examiner asked "What's the matter?" and then responded to the child's request-command. Again, all responses were recorded using the molecular system of notation (Sugarman, 1973).

A five point rating scale was designed to correspond to the major stages and orientation in the developmental sequence of the imperative as described by Sugarman. In fact, the response descriptors closely followed her data. Green's (1959) modification of Guttman's (1947) scaling procedure was applied to data in the pilot study. The imperative performative rating scale achieved an index of consistency of .839 which is considered significantly scaleable.

All subjects were seen in their homes on three to five occasions within ten days. The mothers were always present during the sessions in order to avoid any counter-productive separation anxiety. A corpus was obtained from each child, and the Bayley Scales of Infant Development (1969), the Ordinal Scales of Psychological Development (1975), and the experimental measures were administered.

Reliability studies were also conducted on the experimental measures and rating scales. Because of the prohibitive cost of video recording, only randomly selected subjects were videotaped to gather data for the reliability studies.

Results and Discussion

Statistical tests revealed significant differences between the performance of normal and language disabled subjects in a number of areas.

An initial concern was whether the experimental measure tapped the child's ability to encode the most informative element in a context. Consequently, chi square tests of association were applied to the frequency with which the normal subjects encoded the most informative element in the

test items by means of either sensorimotor responses, linguistic responses, or both types of responses. The normal subjects encoded the novel element in a context with a sensorimotor performative significantly more than 50% of the time. They encoded the same element linguistically significantly more than 50% of the time. (See Table 1). That is, the child with normal

Table 1: X^2 tests on presuppositional data

	ENCODING OF MOST INFORMATIVE ELEMENT								
S's	Sensorimotor			Linguistic			Overall: S-M + Lg.		
	X^2	df	P	X^2	df	P	X^2	df	P
N	26.5	1	.001	33.84	1	.001	62.406	1	.001
LD	33,54	1	.001	0.68	1	NS	11.62	1	.001

language development at the holophrastic stage can performatively encode the most informative contextual element with either linguistic or non-linguistic means significantly more frequently than a 50-50 chance would permit. If, in fact, one considers the number of elements in the context which the child could conceivably encode instead of the novel or changing one, a 50% chance of doing so is a generous proportion.

The language disabled children, on the other hand, behaved somewhat differently. While they were able to signal the most informative element with a sensorimotor performative significantly more frequently than chance probability would predict, they were unable to do so linguistically. A proportionate test applied to the data indicated that the two groups were significantly different only in terms of their linguistic presuppositional encoding.

The language disabled subjects appeared to linguistically encode a less informative element in the context almost as often as they encoded a more informative one. Could it be that the attentional problems of the language disabled child affected his ability to encode his comment with linguistic symbols? If so, one would then also expect his sensorimotor signalling of the most informative element to be similarly affected. A general delay or disorder in the language disabled child's differentiation process was also considered. However, a primary differentiation delay or disorder would predict that these subjects would generate fewer verbal responses overall (which did, in fact, also happen); it would not predict that they would encode a less informative contextual element. A symbolic retrieval problem was also ruled out as a primary explanation since no disruptions of fluency, obvious differences in responses latencies, or self-correcting behavior was observed in the data. A representational deficit or difference, then, seemed to be the only explanation to adequately account for the presuppositional "misfires" of the language disabled child. This deficit appeared to be dynamic in nature. That is, it did not affect or involve the child's one-to-one linear representation of symbol for referent. The subjects were matched for mean length of

utterance and had comparable vocabularies. Rather, the language disabled child seemed to have difficulty manipulating these symbols so that he could use them for communication, problem solving, and so forth.

Qualitative analyses of the subjects' presuppositional responses revealed that all of the normal children and none of the language disabled children generated more complex responses. For example, on one presuppositional item the child took do l figures from the rear of a dump truck. After he had reached criterion, a horse figure was then placed in the truck for him to remove. One of the normal subjects, upon seeing the horse figure, ceased his activity, turned his body toward his mother, established eye contact with her, and said "nona" (Grandma or Nana). His mother explained to the examiner that his grandmother lives on a horse ranch. Inspection of the child's lexicon indicated that he had the word "horsie" and that he used it to refer to horses and cows. The best response of any of the language disabled subjects to this item was "horsie", its direct symbolic referent. Using Parisi and Antinucci's (1973) generative semantic grammar, these extended presuppositions generated by the normal children could be represented as containing an additional predication. Instead of simply labeling the new stimulus introduced into the context, the children referred to some past experience that was, in some way, related to the new stimulus. This ability to represent some thing or experience no longer perceptually present is considered characteristic of the sixth stage of the Piagetian period of sensorimotor intelligence.

Statistical analysis of the performative data also offered some significant findings. T tests demonstrated that there was a significant difference between the declarative, imperative, and all performative scores of the normal and language disabled subjects.

Table 2: t Tests applied to performative scores

t Test	Decl.	Imp.	Decl. + Imp.
t	6.16	5.10	6.30
df	28	28	28
p	.001	.001	.001

An analysis of variance was conducted on the data. It revealed that the mean scores of the language disabled subjects were significantly lower than those of the normal subjects on both performative measures. Both groups of children scored significantly better on imperatives than declaratives.

Table 3: Source table for factorial analysis of variance

Source	SS	df	MS	F	P
Group	34.8081	1	34.8081	37.395	.001
S's in G	26.0626	28	.9308	--	--
Tasks	5.4601	1	5.4601	23.338	.001
G x T	.00416	1	.00416	.017	NS
T x S's	6.5506	28	.2339	--	--

The effect of the children's better performance on imperative items appeared to be related to the nature of the two performative measures. The imperative tasks seemed to carry a greater penalty for ineffective performance: the child could not obtain the stimulus object as quickly as he wanted it. The declarative penalty, on the other hand, implies not obtaining the adult's attention at that time.

A series of t tests applied to the frequency of non-responses, sensorimotor and verbal performative responses to the experimental measures revealed a number of significant differences between the two groups. The largest differences between the two groups of children were always in the linguistic categories, with normals producing significantly more linguistic imperatives and declaratives. Also, the language disabled children produced significantly more sensorimotor imperatives than the normal children. In summary, the statistical analysis revealed that despite the fact that the language disabled and normal subjects were both matched for level of linguistic performance and had comparable lexicons, the language disabled subjects' pragmatic use of that language was deficient. They experienced obvious difficulty in generating linguistic performatives. Qualitative analysis of the children's responses using Bates' (1974) modification of Parisi and Antinucci's (1973) grammar demonstrated that the performatives of the language disabled subjects were more closely tied to the immediate context of the situation than those of their matched normal counterparts. This would imply that their stage six sensorimotor intelligence capacity for representational thought had not yet been attained, supporting the case for a representational deficit.

In order to more systematically determine the specific cognitive abilities related to pragmatic performance, all subjects were administered a standardized Piagetian measure of sensorimotor intelligence. The six scales were placed into multiple regression analyses for the prediction of performance on the declarative and imperative performative measures. While deferred imitation and object permanence are generally considered critical to the child's use of language for symbolic representation (Menyuk, 1975), the multiple regression analyses indicated that the child's development of means-end relations was the single predictor which accounted for most of the variance among the declarative and imperative scores.

Table 4: Summary table of multiple regression for prediction of declarative performance

VARIABLE ENTERED	F TO ENTER	P	MULT. R	R SQ.	R	OVERALL F	P
Dev. of Means	22.2378	.000	.66532	.4426	.6653	22.2378	.000
Obj. Permanence	1.3986	.247	.6856	.4701	.0942	11.9766	.000
Gest. Imit.	.4201	.523	.6917	.4785	.1474	7.9529	.001
Obj. in Space	.2414	.627	.6953	.4835	.1477	5.8510	.002
Schemas	.0281	.868	.6957	.4841	.2859	4.5045	.005

Table 5: Summary table of multiple regression for prediction of imperative performance

VARIABLE ENTERED	F TO ENTER	P	MULT. R	R SQ.	R	OVERALL F	P
Dev. of Means	24.4596	.000	.6828	.4664	.6828	24.4596	.000
Schemas	.7757	.402	.6929	.4802	.3475	12.4721	.000
Vocal Imit.	.7249	.387	.7037	.4952	.0561	8.5042	.000
Oper. Causal.	.3004	.588	.7080	.5012	.1662	6.2817	.001
Obj. in Space	.2475	.622	.7116	.5064	.1342	4.9244	.003
Gest. Imit.	.0944	.761	.7130	.5084	.1661	3.9646	.007

While the child's development of sixth stage object permanence and deferred imitation abilities seemed to have occurred prior to their criterial use of holophrastic performatives, it did not seem to be a critical factor or co-occurring phenomenon with their leap from the criterial use of sensorimotor to symbolic performatives. Their ability to perceive the symbol as a means which can be used to achieve their goal and to re-present this relationship to themselves so that they can anticipate the end of the event seemed to be critical to their mastery of the holophrase as a pragmatic tool. The performance of language disabled subjects on the Piagetian tasks revealed that they did well on all tasks except those on which the child must demonstrate foresight in solving a problem. He must be able to symbolize or represent it for himself in order to do this. The language disabled children could only solve such problems by trial and error. Although they had acquired the linear one-to-one relation of object to word, they experienced difficulty in the use of linguistic and non-linguistic symbols in context.

In conclusion, the data offered repeated support for a specific representational deficit in language disabled children which affects the dynamic aspects of symbolization. Their presuppositions remained closely tied to the immediate context. They had difficulty in generating linguistic performatives, and had corresponding problems in developing sixth stage sensorimotor intelligence abilities in means-end relations. These findings stand in contrast to the popular notion of the general representational deficit in language disabled children, and underscore the importance of language as a tool in social interaction.

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